Minnesota Public Safety Broadband LTE Network Pilot Project

Executive Summary

Background

In March 2015, the State of Minnesota began its first public safety broadband LTE pilot program.

The state's purpose in conducting the pilot was to design, deploy and evaluate a broadband LTE network as part of its ongoing collaboration with the First Responder Network Authority (FirstNet). The authority is charged with building, operating and maintaining the first high-speed nationwide wireless broadband network dedicated to public safety. All 56 states and territories in the United Stated must have radio access to a network connected to the FirstNet core network.

The pilot concluded in December 2015.

The pilot is a first for the state. It is the first broadband LTE network test performed by any state in the upper Midwest. It also is the first anywhere to consider testing the concept of sharing spectrum allocated to FirstNet with an electric utility, one of 16 industries considered critical infrastructure by the U.S. Department of Homeland Security.

"Our vision for the pilot project was to clearly demonstrate that broadband is no longer simply a technological discussion…it is a reality," says Mark Dunaski, Deputy Commissioner, Minnesota Department of Public Safety. "What all of us in public safety

need to do is understand its benefits, determine how best to design and deploy them, and how best to use their capabilities to save lives and protect property."

The Pilot Mission

- Demonstrate and evaluate a public/private partnership in a public safety broadband network "live" exercise.
- Collect design, deployment and performance information that could be provided to FirstNet.
- Enable public safety agencies in non-urban areas of Minnesota to experience the benefits of public safety broadband LTE. This could generate considerable support for FirstNet nationally as well as for the network's future deployment within the state.
- Perform technical evaluations of currently available public safety-grade Band 14 LTE equipment.

Location

The pilot was conducted in Elk River, Minn., a community of 22,000, 35 miles northwest of Minneapolis. The site was selected in part because it would provide the opportunity to test how broadband could serve rural and remote communities.

Leadership

Executive Summary

The State of Minnesota Emergency Communication Networks (ECN) led the pilot project. ECN manages the statewide 911 program and NG911 network, the Allied Radio Matrix for Emergency Response (ARMER) shared statewide digital P25 radio communications network, and the ongoing interoperability program.

"As we began to consider how best to approach broadband, we at ECN wanted to serve as a facilitator for the entire discussion," says Jackie Mines, Division Director for ECN. "We wanted to make broadband 'real' for everyone. We wanted to say that this is how the system could look, this is how it could operate, these are the advantages we could all receive, and this is the coverage we could achieve."

The Minnesota Statewide Emergency Communications Board (SECB) also performed a leadership role. The SECB is composed of 20 government and public safety officials representing counties and cities statewide. The SECB provides governance for interoperable communications in the state including the potential adoption and implementation of the FirstNet Nationwide Public Safety Broadband Network.

Stakeholders

Much of the success of the pilot can be attributed to the stakeholders who contributed hardware, software and technical support for the pilot at no charge to the state.

In addition to the ECN and SEBC public stakeholder, the Pilot project included these private stakeholders:

- **NewCore Wireless** offers hosted, full-service GSM/UMTS/LTE wireless switching services to customers in 18 states including rural carriers. They provided hosted switching services for the eNodeB and Band 14 devices as well as technical expertise. They wanted to generate as much network operational information as possible that could be provided to the state and FirstNet.
- **Great River Energy** is a regional electric generation and transmission cooperative serving 650,000 homes, businesses and farms. The cooperative provided a system antenna site and backhaul equipment for the network's LTE Core. As potential partners in a public/private broadband network, they were especially interested in evaluating spectrum sharing that would enable them to perform some of their most challenging monitoring, restoration and recovery takes in emergencies without compromising public safety spectrum needs.
- **Motorola Solutions** is a provider of communications devices and applications for government and public safety agencies and enterprises worldwide. It provided the eNodeB for the test as well as communications devices, software and technical expertise. In laboratory tests, they confirmed that public safety and

electric utilities could share a small amount of public safety broadband spectrum without compromising the mission of either.

- **City of Elk River**, and particularly its fire department, hosted the entire pilot exercise.
- **Sonim Technologies** is a provider of rugged, water-submersible mobile phones designed specifically for public safety and other demanding and hazardous environments. The company provided smartphones for the pilot.
- **Lociva** provides a variety of deployable broadband network solutions.

Pilot Structure

The pilot project included three parts:

1. A Tabletop Exercise that enabled participants to respond conceptually to a familiar emergency situation from a broadband LTE technology point of view. More than 70 participants from more than 40 agencies participated. The exercise was designed, conducted and facilitated by experts from the U.S. Department of Homeland Security, Office of Emergency Communications (OEC), Interoperable Communications Technical Assistant Program (ICTAP).

2. An Industry Day broadband LTE equipment trade event at which participants had the opportunity to hear from stakeholders about broadband devices and systems.
3. A Functional Exercise that provided participants the opportunity to actually use devices over a "live" broadband" network.

Achievements

Project leaders were pleased that the Pilot achieved most of its mission in spite of a tight timetable.

Importantly, they believed that pilot participants came away with a much deeper understanding of the benefits of a public safety broadband Band 14 LTE network and the critical factors that will ensure its successful deployment in the future.

- **Broadband is a communications multiplier that benefits everyone.** The information that a Band 14 LTE public safety broadband network generates clearly can enhance situational awareness in every emergency.
- **Public/private network partnerships are possible and can be a significant asset.** Identifying and considering possible partnerships can have a significant impact on effectively deploying, managing and potentially funding future broadband networks.

- **Broadband education is vital to its effective and confident use.** The pilot revealed that broadband knowledge is at best "uneven" throughout public safety agencies in the state. Future deployment will require a concerted effort to elevate everyone's understanding about what public safety broadband can do and how best to put its features and capabilities to use.
- **Inter-agency and industry partner conversation about broadband matters.** Agencies not only must thoroughly discuss broadband within their agencies, but also engage other public safety agencies and potential industry partners in their communities.

Recommendations for the Future

For everyone involved in the pilot, the experience crystalized a number recommendations for the broadband future statewide.

- **Develop and support an effective governance structure**. Minnesota's success with public safety communications has been built on its robust, broadly representative and collaborative public safety communications governance structure. The SECB's leadership in this pilot provided the program with the legitimacy to secure the stakeholder support it needed. The governance structure

will similarly be critical to the rollout and adoption of a public safety network statewide.

- **Work closely with communications manufacturers.** Given the development cycle for new broadband devices and networking systems, public safety users and communications manufacturers need to work together more closely and earlier in the developmental cycle.
- **Develop a comprehensive IT staffing approach.** Staffing and training will put different and difficult pressures on agencies. Staffing broadband networks will require searching for personnel with specific and extensive IT expertise. With the speed of technological change, a comprehensive training plan will be vital, too. Broadband responsibilities should not simply be added to the heavy workloads of already challenged PSAP and dispatch personnel.
- **Create a plan for data management.** This plan will require disciplined execution. Broadband will enable the capture of enormous amounts of data. This will raise considerable governance, legal, policy, organizing and use issues that must be addressed.

"I was pleased to see that everyone was around the table contributing, learning, understanding and working hard with each other to figure out how best to implement broadband networks," says Dunaski. "We know that success in designing and

deploying these systems will depend on opening lines of communications. It's all about personal relationship, involvement and commitment. And, I believe this pilot demonstrated that public safety in Minnesota is ready to move forward."

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